What is claimed is:

1. A switching signal generator for use in a switching power supply, comprising:

a $\Delta\Sigma$-modulator for $\Delta\Sigma$-modulating an analog signal or a multi-bit digital signal such that switching of a power switch element is made in response to the modulated signal;

a gate driver circuit for a switching signal for said power switch element; and

a feedback path for feeding back output of said gate driver circuit to said $\Delta\Sigma$-modulator.

2. A switching signal generator according to claim 1, wherein said $\Delta\Sigma$-modulator comprises at least one integrator and at least one adder, and wherein an output of said at least one adder is connected to said at least one integrator, and an output of said at least one integrator is connected to a quantizer input.

3. A switching signal generator according to claim 1 or 2, wherein said feedback path extends from an output of said gate driver circuit connected to a quantizer output to an input of said at least one adder.

4. A switching signal generator according to claim 1 or 2, wherein said gate driver circuit receives a quantizer output signal and performs thereon either one or both of voltage amplification and current amplification sufficient to drive said power switch element.

5. A switching signal generator according to claim 3, wherein said gate driver circuit receives a quantizer output signal and performs thereon either one or both of voltage

amplification and current amplification sufficient to drive said power switch element.

6. A switching signal generator according to claim 1 or 2, wherein said feedback path comprises an attenuator for adapting a pulse signal of large amplitude of said gate driver circuit to an input signal level of said $\Delta\Sigma$-modulator.

7. A switching signal generator according to claim 3, wherein said feedback path comprises an attenuator for adapting a pulse signal of large amplitude of said gate driver circuit to an input signal level of said $\Delta\Sigma$-modulator.

8. A switching signal generator according to claim 4, wherein said feedback path comprises an attenuator for adapting a pulse signal of large amplitude of said gate driver circuit to an input signal level of said $\Delta\Sigma$-modulator.

9. A DC-DC converter comprising:

a $\Delta\Sigma$-modulator for $\Delta\Sigma$-modulating an analog signal such that switching of a switching element is made in response to the modulated signal;

at least one integrator constituting said $\Delta\Sigma$-modulator and provided with a gain-adjusting means; and

a detector circuit for detecting a current flowing internally of said DC-DC converter, a voltage internally of said DC-DC converter, or a converter output voltage,

wherein said gain-adjusting means adjusts gain of said integrator based on a signal from said detector circuit such that output of said integrator becomes a desired voltage.

10. A DC-DC converter according to claim 9, wherein said detector circuit detects an output voltage of said at least one integrator provided with said gain-adjusting means and

outputs a signal for adjusting the gain of said at least one integrator provided with said gain-adjusting means.

11. A DC-DC converter according to claim 9, wherein said gain-adjusting means comprises a comparator that supplies a control signal to a switch element for said integrator such that said switch element is turned off if a converter output current is great and is turned on if the converter output current is small.

12. A DC-DC converter according to claim 9 or 10, wherein said gain-adjusting means comprises an absolute value circuit for rectifying output of said integrator, an averaging circuit for averaging the rectified signal, an adjustment error amplifier for comparing the averaged signal with a reference voltage and amplifying the differential signal, and a transistor located at an input of said integrator, which is controlled by the signal amplified at said adjustment error amplifier.